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FOREST SERVICE



Northeastern Area
State & Private Forestry
DIVISION OF FOREST PEST CONTROL

5230



US FOREST SERVICE
NA - S&PF - FIELD OFFICE
FEDERAL BLDG. - US COURT HOUSE
316 ROBERT ST.
ST. PAUL, MINN. 55101

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EVALUATION OF THE USE OF AERIAL PHOTOGRAPHY
TO DETECT SCLERODERRIS CANCER

By James T. O'Brien

Introduction

Scleroderris canker, caused by the fungus *Scleroderris lagerbergii*, has damaged many red pine plantations in the Lake States, some of them seriously. Given the number of red pine plantations in the Lake States area, it would be of great advantage to increase the coverage of surveys for this disease. To determine if aerial photography could be used for this purpose, infected red pine plantations were photographed with both infra-red and true color film.

Methods

Five plantations in which the approximate amount of infection was known, and which contained both infected and uninfected portions in 1965 were chosen for the test survey. The five consisted of one plantation on the Ottawa National Forest and four plantations on the Nicolet National Forest. Infection in these plantations varied from about 1% of the trees infected to about 26%.

A K-17 aerial camera (12" focal length) mounted in the camera hatch of the Forest Service's Aero-Commander was used on the first flight, during which each plantation was photographed alternately with Kodak Ektachrome Infra-red Aero Film, Type 8443 and Kodak Ektachrome Aero Film, Type 8442. Photographs were taken from three heights above each plantation - 1000'; 1200'; and 1500'. The survey was then repeated with a 70 mm camera (6" focal length) containing true color film (Ektachrome MS, Aerecon Film, Type 80-282); photographs were taken at 1000' and 1200'. An attempt was made to get stereo coverage where possible, so the Aero-Commander was flown at minimum safe air speed during photography (approximately 90 MPH).

Results

No symptoms of infection (dead branches) could be discerned on the photographs, even at the low altitude flown, and even though the resolution



was high. Had the symptoms been visible, the 70 mm film would have been superior to the 9" x 9" for this type of survey (of 6-50 acre plantations). The image resolution of the 70 mm was better and the recycling speed of the camera (up to 10 frames per second) permitted full stereo coverage at much lower altitudes than did that of the K-17. The coverage yielded by the 70 mm film (a strip about 460' wide at 1000') was adequate. A comparison of the two films used in the K-17 reveals that the true color and the infra-red were about equal in resolution. However, had infection been discernable, the true color would probably have been easier to interpret because of the more familiar hues.

Conclusions

Aerial photography cannot be used to survey for Scleroderris canker in the manner described. Even photographing from an altitude below 1000' probably would not improve the results unless infection were considerably more damaging than it was in the plantations chosen. Branches killed by Scleroderris infection are usually too low in the crown to be seen from above, except when the trees are so small the trees themselves are difficult to see.